

PATENT COOPERATION TREATY

REC'D 29 AUG 2006

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From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/041484

International filing date (day/month/year)
10.12.2004

Priority date (day/month/year)
10.12.2003

International Patent Classification (IPC) or both national classification and IPC
INV. H01M4/48 H01M4/62

Applicant
ROVCAL, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/041484

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/041484

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

- ☐ the entire international application
- ☒ claims Nos. 164-177 and partially claims 1,2,6,30,31,34-36,46,47,56,70,71,74-76, 89, 90,94,104,117,118,121,122,123, 127,128,139,154,155,158,159,160,178,186,205,215-218,222,228, 229,233,239,240,248,249,250,253

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):
- ☒ no international search report has been established for the whole application or for said claims Nos. 164-177 and partially claims 1,2,6,30,31, 34-36,46, 47,56,70, 71,74-76,89,90,94,104,117,118,121-123,127,128,139,154,155,158-160,178,186,205,215-218,222,228, 229,233,239,240,248,249,250,253
- ☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:
- ☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.
- ☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rules 13ter.1(a) or (b).
- ☐ a meaningful opinion could not be formed without the tables related to the sequence listings; the applicant did not, within the prescribed time limit, furnish such tables in electronic form complying with the technical requirements provided for in Annex C-bis of the Administrative Instructions, and such tables were not available to the International Searching Authority in a form and manner acceptable to it.
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in electronic form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.
- ☐ See Supplemental Box for further details

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/041484

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has, within the applicable time limit:
- ☐ paid additional fees
 - ☐ paid additional fees under protest and, where applicable, the protest fee
 - ☐ paid additional fees under protest but the applicable protest fee was not paid
 - ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-163 ;178-259

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-163, 178-259
Inventive step (IS)	Yes: Claims	
	No: Claims	1-163, 178-259
Industrial applicability (IA)	Yes: Claims	
	No: Claims	1-163, 178-259

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/041484

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)
and /or
2. Non-written disclosures (Rules 43*bis*.1 and 70.9)
see form 210

Re Item III.

1. The present claims 1, 46, 89, 127, 178, 205, 228, 239 relate to an extremely large number of possible compounds. Support and disclosure in the sense of Article 6 and 5 PCT is to be found however for only a very small proportion of the compounds claimed, see [examples on page 16 to 17]. The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of claims 1, 46, 89, 127, 178, 205, 228, 239 (PCT Guidelines 9.19 and 9.23).

The search of claims 1, 46, 89, 127, 178, 205, 228, 239 was restricted to those claimed compounds (a cathode comprising manganese dioxide and copper oxide) which appear to be supported and a generalisation of their structural formulae, [examples on page 16 to 17] and therefore the examination was restricted accordingly.

2. Present claim 256 is not supported by the examples. Support and disclosure in the sense of Article 6 and 5 PCT is to be found however only for simple oxides and not for mixed oxide compounds, see examples on page 16 to 17. The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of claim 256 (PCT Guidelines 9.19 and 9.23).

The search of claim 256 was restricted to those claimed compounds which appear to be supported and a generalisation of their structural formulae, [examples on page 16 to 17] and therefore the examination was restricted accordingly.

Nevertheless, the subject-matter of claim 256 appears to be anticipated by the disclosure of D1.

3. Present claims 2, 6, 30, 31, 34-36 46, 47, 56, 70, 71, 74-76, 90, 94, 104, 117, 118, 121-123, 127, 128, 139, 154, 155, 158, 159, 160, 186, 215-218, 222, 229, 233, 240, 248-250, 253 relate to a compound which has a given desired property or effect, namely :

- having a discharge capacity greater than that of an otherwise cell (claims 2, 47, 90, 128)
- having a discharge voltage lower than an initial discharge voltage of the active material (claims 6, 46, 94, 127)

- generating anode-fouling species soluble in the electrolyte and capable of migrating towards the anode or capable of fouling an anode (claims 30, 70, 117, 154, 215, 248)
- reducing anode fouling by the soluble species (claims 31, 71, 118, 155, 216)
- preventing some of the generated soluble species from migrating toward the anode (claims 34, 74, 121, 158)
- blocking the soluble species from migrating towards the anode (claims 35, 75, 122, 159, 218, 250)
- limiting access of the electrolyte to the extender to reduce soluble species generation (claims 36, 76, 123, 160)
- having a specific discharge capacity of at least as high as that of the active material (claims 56, 104, 139, 186, 222, 233, 253)
- capturing at least some of the species (claim 217)
- having a voltage level relative to a reference electrode less than an initial voltage level of the active material relative to the reference electrode (claims 229, 240)
- adsorbing at least some of the species (claim 249)

However, the description does not provide support and disclosure in the sense of Article 6 and 5 PCT for any such compound having the said property or effect and there is no common general knowledge of this kind available to the person skilled in the art. This non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of the claim (PCT Guidelines 9.19 and 9.20).

The search of claims 2, 6, 30, 31, 34-36, 46, 47, 56, 70, 71, 74-76, 90, 94, 104, 117, 118, 121-123, 127, 128, 139, 154, 155, 158, 159, 160, 186, 215-218, 222, 229, 233, 240, 248-250 and 253 was consequently restricted to the specifically disclosed compound having the desired property or effect, see examples on pages 16 to 17 (a cathode comprising EMD and CuO) and to the broad concept of a compound having the desired property or effect.

Re Item IV.

The separate inventions/groups of inventions are:

Claims 1-163, 178-259 :

A electrochemical cell comprising a cathode including a primary active material and an extender. The method for producing such an electrochemical cell.

Claims 164-177 :

An electrochemical cell comprising a cathode and an anode wherein the anode has a capacity of at least 0.5 Ah per cubic centimeter of cell internal volume.

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

According to the PCT International Search and Examination Guidelines, Part III, 10.06 (as in force from March 25, 2004), unity of invention has to be considered in the first place only in relation to the independent claims.

There are two groups of independent claims :

Group I : claims 1 to 163, 178 to 259

Group II : claims 164 to 177

It appears that within independent claims 1 to 163, 178 to 259 on the one hand and independent claims 164 to 177 on the other hand unity does not exist for the following reasons : The "same" or "corresponding" technical feature between these independent claims is the provision of an electrochemical cell comprising an anode, a cathode and a separator disposed between the anode and cathode. This feature is already known from D1 (WO03096448).

Therefore, this feature is not a special (new and inventive) technical feature. Thus, no "same" or "corresponding" special technical features could be found between the independent claims 1 to 163, 178 to 259 on the one hand and independent claims 164 to 177 on the other hand, as required by Rule 13.2 PCT. Also the common problem underlying the invention, namely how to improve the discharge efficiency of alkaline batteries, is already known, see document D1, on page 2, line 9 to 30.

No other common problem could be found which could serve as the general inventive concept required by Rule 13.2 PCT. Consequently, these claims are not unitary according to Rule 13 PCT.

Thus, the application is split into two groups of inventions : According to Article 17(3)a PCT the ISA shall establish the International Search Report on those parts of the International Application which relate to the invention first mentioned in the claims, i.e., the above mentioned group I.

Present claim 164 relates to a compound which has a given desired property or effect, namely having a capacity of at least 0.5 Ah per cubic centimeter of cell internal volume. However, the description does not provide support and disclosure in the sense of Article 6 and 5 PCT for any such compound having the said property or effect and there is no common general knowledge of this kind available to the person skilled in the art. This non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of the claim (PCT Guidelines 9.19 and 9.20).

The search of claim 164 may consequently be restricted.

Re Item V.

1. Reference is made to the following document:
D1: WO 03/096448 A (THE GILLETTE COMPANY; WANG, FRANCIS; EYLEM, CAHIT; XUE, JIAYU, SIMON;) 20 November 2003 (2003-11-20)
- 2 INDEPENDENT CLAIM 1
 - 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (page 10, line 16 to 26): an electrochemical cell comprising a container defining a positive cell terminal end and a negative cell terminal end; a cathode disposed in the container and including manganese dioxide ; an extender different from the primary active material (silver copper oxide) and present in an amount no greater than that if the primary active material ; and an anode including an anode material

disposed in the container adjacent the cathode ; and at least one separator disposed between the anode and cathode, and further disposed between the anode and extender.

3 INDEPENDENT CLAIM 46

- 3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 46 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (page 10, line 16 to 26): an electrochemical cell comprising a container defining a positive cell terminal end and a negative cell terminal end; a cathode disposed in the container and including manganese dioxide ; an extender different from the primary active material (silver copper oxide) ; and an anode including an anode material disposed in the container adjacent the cathode ; and at least one separator disposed between the anode and cathode, and further disposed between the anode and extender.

4 INDEPENDENT CLAIM 89

- 4.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 89 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (page 10, line 16 to 26): a method for producing an electrochemical cell, the method comprising the steps of providing a cell container defining a positive cell terminal and a negative cell terminal end; placing a cathode in the container, wherein the cathode comprises a primary active material (manganese dioxide) ; placing an extender (silver copper oxide) in the container the extender different from the primary active material and present in an amount no greater than that of the primary active material; placing an anode in the container ; and providing at least one separator between the anode and cathode and between the anode and the extender.

5 INDEPENDENT CLAIM 127

- 5.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 127 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (page 10, line 16 to 26): a method for producing an electrochemical cell, the method comprising the steps of providing a cell container defining a positive cell terminal and a negative cell terminal end; placing a cathode in the container, wherein the cathode comprises a primary active material (manganese dioxide) ; placing an extender (silver copper oxide) in the container the extender different from the primary active material ; placing an anode in the container ; and providing at least one separator between the anode and cathode and between the anode and the extender.

6 INDEPENDENT CLAIM 178

- 6.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 178 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (page 10, line 16 to 26): an electrochemical cell comprising an anode; a cathode comprising manganese oxide ; an extender (silver copper oxide) and at least one separator disposed between the anode and both the cathode and the extender.

7 INDEPENDENT CLAIM 205

- 7.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 205 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (page 10, line 16 to 26): a cathode usable in an alkaline electrochemical cell, the cathode comprising a primary active material ; and an extender (silver copper oxide) different from the primary active material and present in an amount no greater than that of the primary active material.

8 INDEPENDENT CLAIM 228

- 8.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 228 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (page 10, line 16 to 26) : a cathode usable in an electrochemical

cell, the cathode comprising a primary active material comprising manganese oxide and an extender (silver copper oxide).

9 INDEPENDENT CLAIM 239

- 9.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 239 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (page 10, line 16 to 26) : an extender usable in combination with a cathode of an electrochemical cell, the cathode comprising a primary active material (manganese dioxide), the extender being different than the primary active material present in an amount no greater than that of the primary active material.

10 INDEPENDENT CLAIM 256

- 9.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 256 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (page 10, line 16 to 26) : a cathode wherein at least a portion of the cathode is identified by silver copper oxide.

11 DEPENDENT CLAIMS 2-45, 47-88, 90-126, 128-163, 179-204, 206-227, 229-238, 240-255, 257-259.

Dependent claims 2-45, 47-88, 90-126, 128-163, 179-204, 206-227, 229-238, 240-255, 257-259 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/041484A. CLASSIFICATION OF SUBJECT MATTER
INV. H01M4/48 H01M4/62

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, COMPENDEX, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/096448 A (THE GILLETTE COMPANY; WANG, FRANCIS; EYLEM, CAHIT; XUE, JIAYU, SIMON;) 20 November 2003 (2003-11-20) page 2, line 9 - line 30 page 4, line 16 - line 27 page 10, line 16 - line 26 examples 2-9	1-163, 178-259
X	US 2003/211392 A1 (NANJUNDASWAMY KIRAKODU S ET AL) 13 November 2003 (2003-11-13) paragraphs [0014], [0015], [0017]	1-163, 178-259
P,X	US 2004/175613 A1 (EYLEM CAHIT ET AL) 9 September 2004 (2004-09-09) paragraph [0038]	1-163, 178-259
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

18 April 2006

Date of mailing of the international search report

29. 08. 2006

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Métais, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/041484

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	US 2004/224229 A1 (MANSUETTO MICHAEL F ET AL) 11 November 2004 (2004-11-11) paragraphs [0033], [0036], [0041], [0042]; claim 1 -----	1-163, 178-259
P,X	WO 2004/082093 A (THE GILLETTE COMPANY; EYLEM, CAHIT; DAVIS, STUART, M; MAO, OU) 23 September 2004 (2004-09-23) page 1, line 17 - line 24 page 1, line 30 - line 32 page 6, line 1 - line 4 page 9, line 5 - line 9 -----	1-163, 178-259
A	US 5 219 685 A (TANIGUCHI ET AL) 15 June 1993 (1993-06-15) column 1, line 14 - line 23; claim 1 column 2, line 44 - line 57 -----	1-163, 178-259

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/041484

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-163, 178-259

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-163 ;178-259

A electrochemical cell comprising a cathode including a primary active material and an extender. The method for producing such an electrochemical cell.

2. claims: 164-177

An electrochemical cell comprising a cathode and an anode wherein the anode has a capacity of at least 0.5 Ah per cubic centimeter of cell internal volume.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/041484

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03096448 A	20-11-2003	AU 2003228856 A1 BR 0309636 A CN 1650451 A EP 1512186 A2 JP 2005524950 T US 2003207173 A1	11-11-2003 08-03-2005 03-08-2005 09-03-2005 18-08-2005 06-11-2003
US 2003211392 A1	13-11-2003	AU 2003225290 A1 BR 0309635 A CN 1692509 A EP 1508178 A2 JP 2005524947 T WO 03096442 A2	11-11-2003 08-03-2005 02-11-2005 23-02-2005 18-08-2005 20-11-2003
US 2004175613 A1	09-09-2004	BR P10407998 A CN 1778005 A EP 1645003 A2 US 2006172194 A1 WO 2004082093 A2	07-03-2006 24-05-2006 12-04-2006 03-08-2006 23-09-2004
US 2004224229 A1	11-11-2004	EP 1629551 A2 WO 2004102699 A2	01-03-2006 25-11-2004
WO 2004082093 A	23-09-2004	BR P10407998 A CN 1778005 A EP 1645003 A2 US 2004175613 A1 US 2006172194 A1	07-03-2006 24-05-2006 12-04-2006 09-09-2004 03-08-2006
US 5219685 A	15-06-1993	NONE	